

## REMARKS

Reconsideration of the present application is respectfully requested. Claims 43-44, 49, 51-54 and 63-65 are rejected under 35 U.S.C. §103(a) as unpatentable over Chen in view of Ruben and further in view of Helmus. Other claims are rejected under section 103 (a) upon Chen in view of Ruben and further in view of Helmus, and further upon additional references. Further, claims 50, 67-70 and 134 are indicated to be in condition of allowance.

With respect to the rejection of Claims 43-44, 49, 51-54 and 63-65 as unpatentable over Chen in view of Ruben and further in view of Helmus, the applicants respectfully disagree with the examiner's position on the teachings of Chen, which is the primary reference cited. Chen is directed to gels and hydrogels, which are not *moldable* biodegradable resins. This is in marked contrast to the present application, which is directed to moldable biodegradable resins. Furthermore, upon reading Chen, it becomes apparent that thermoreversability, as meant by Chen, is entirely different from what is meant by the term in the present application. In the claimed subject matter, it is indicated that thermoreversible refers to a covalent bond of a polymer that can be reversibly cleaved and reformed through heating and cooling. Specifically, claim 43 recites a biodegradable moldable resin having a Diels-Alder type functional group having "a thermo-reversible cross-linked structure which is covalently bonded by cooling and cleaved by heating, wherein said functional group forms said thermo-reversible cross-linked structure which is covalently bonded at a temperature for use as a molded article and cleaved at temperatures over 120°C".

In contrast, Chen uses "thermoreversible" to describe gels that swell and shrink in a temperature dependent manner. Specifically, Chen provides that "swelling requires relaxation of entangled polymer chains," see Chen, col. 25, lines 51-52, and further that "the

thermoreversability of sucrogels results from a combination of hydrophobic side chains and the hydrophilic and bulky sucrose moiety of the sucrose monomers (Col. 25 lines 66 – col. 26 line 2). In other words, it is apparent that in Chen, thermoreversability means the relaxation of the polymer chain or affinity of the chain for water, which can be reversed by heating and cooling. This is supported by the description of Figure 12 in column 5 where it is stated "the figure depicts the thermoreversible swelling and shrinking". In other words, "thermoreversability", as used by Chen, refers to temperature dependent swelling and shrinking phenomenon, not to the cleaving or reformation of a covalent bond.

Ruben does not cure the aforementioned deficiencies of Chen, and reliance on Ruben is not understood here. Ruben does not teach thermoreversible resins. In fact, with the understanding the bandage taught by Ruben breaks down in the presence of water – that is, the bandage undergoes hydrolysis – it is Applicants' position that the combination of Chen and Ruben teach away from the present invention. Whereas with the claimed subject matter of the present application, the thermoreversible cross-lined structure is broken in the presence of elevated temperatures (that is, at temperatures of more than 120°C), Chen and Ruben's combined teachings indicate that bond cleavage occurs in the presence of water. On this basis, we understand that Chen and Ruben teach away from the present invention.


Further, Helmus does not cure the deficiencies of Chen nor Ruben. Reliance upon Helmus, which purports to show the use of PLA in a purportedly similar environment to the claimed subject matter, is not appropriate. Helmus teaches a use of PLA that is clearly different from the claimed subject matter. First, there is no indication that Helmus is directed to a moldable, biodegradable resin. In contrast, Helmus teaches a biomedical article, specifically, a bioactive coating to prevent tissue growth on a heart valve. Helmus indicates "the bioactive

agent is covalently bound to a material that coats one or more components of the prosthetic valve of the invention.” Helmus, ¶[0068], page 6. Helmus indicates that the coating may be PLA. *Id.* Thus unlike the claimed subject matter which is directed to a biodegradable moldable resin, which can be PLA, which biodegradable resin includes a thermoreversible cross linked structure, the heart valve taught by Helmus would be understood as (1) being a non-biodegradable article; in contrast to the biodegradable moldable resin of the present claimed subject matter; as Helmus instead uses PLA as the bridge between the valve and bioactive agent, as opposed to the biodegradable resin per se, and (2) not teaching a resin that has a “functional group [forming a] thermo-reversible cross-linked structure which is covalently bonded at a temperature for use as a molded article and cleaved at temperatures over 120°C and equal to or lower than the molding temperature, and wherein said Diels-Alder type functional group forms the covalent bonds”. See claim 43. In other words, Helmus does not teach the thermoreversible structure recited in the present claims, which thermoreversible structure is based on a Diels-Alder type functional group. Accordingly, Helmus teaches away from biodegradable resins containing thermoreversible cross-linked structures. The person of skill in the art world would not look to Helmus for ways of providing a biodegradable resin with a thermoreversible feature. Accordingly, Helmus fails to cure the deficiencies of Chen alone or Chen combined with Ruben. Thus the rejection of the aforementioned claims based on the combination of Chen, Ruben, and Helmus is traversed.

The other rejections set forth in the office action are based on § 103, and have their basis in the § 103 rejection founded on Chen in view of Ruben and Helmus, as applied to the above noted claims, although such rejections draw upon the teachings of additional references. As we pointed out, Chen in view of Ruben and Helmus teaches away from the present invention. The additional references do not cure this deficiency. Accordingly, it is our view that all claims of the

present application are in condition of allowance.

Wherefore, based upon the foregoing, it is respectfully submitted that the present application is in condition for allowance and a relatively early reply would be gratefully appreciated.

Respectfully submitted,  


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